User's
Manual

# Models UM350/UM330 Digital Indicator with Alarms User's Manual

IM 05F01D02-41E

YOKOGAWA
Yokogawa M&C Corporation

IM 05F01D02-41E
2nd Edition

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# Introduction

**Thank you for purchasing the UM350/UM330 digital indicator with alarms.**

## ■ How to Use the Manuals

| Purpose | Title | Description |
|---|---|---|
| Setup | 1. Installation | Describes the tasks (installation, wiring, and others) required to make the indicator ready for operations. |
| Basic operation | 2. Initial Settings | Describes examples of setting PV input types, and alarm types. Making settings described herein allows you to carry out basic monitoring. |
| Operating procedures and troubleshooting | 3. Operations<br>4.1 Troubleshooting | Describes examples of setting alarm setpoints, as well as key operation necessary to run the indicator. |
| Brief operation and setpoint recording | 5. Parameters | Contains the parameter map used as a guideline for setting parameters and lists of parameters for recording user settings. |

## ■ Regarding This User's Manual

(1) This manual should be provided to the end user. Keep an extra copy or copies of the manual in a safe place.

(2) Read this manual carefully to gain a thorough understanding of how to operate this product before starting operation.

(3) This manual describes the functions of this product. Yokogawa M&C Corporation (hereinafter simply referred to as Yokogawa) does not guarantee the application of these functions for any particular purpose.

(4) Under absolutely no circumstances may the contents of this manual, in part or in whole, be transcribed or copied without permission.

(5) The contents of this manual are subject to change without prior notice.

(6) Every effort has been made to ensure that the details of this manual are accurate. However, should any errors be found or important information be omitted, please contact your nearest Yokogawa representative or our sales office.

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## ■ Safety Precautions

The following symbol is indicated on the indicator to ensure safe use.

**CAUTION**

This symbol on the indicator indicates that the operator must refer to an explanation in the user's manual in order to avoid the risk of injury or death of personnel or damage to the instrument. The manual describes how the operator should exercise special care to avoid electric shock or other dangers that may result in injury or loss of life.

The following symbols are used in the hardcopy user's manuals.

### NOTE

Indicates that operating the hardware or software in a particular manner may damage it or result in a system failure.

### IMPORTANT

Draws attention to information that is essential for understanding the operation and/or features of the indicator.

## ■ Regarding Force Majeure

Yokogawa M&C Corporation assumes no liability for any loss or damage, direct or indirect, caused by the use of or unpredictable defects of the product.

# Models UM350/UM330
# Digital Indicator with Alarms
# User's Manual

IM 05F01D02-41E 2nd Edition

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# 1. Installation

**This chapter describes installation, wiring, and other tasks required to make the indicator ready for operation.**

## 1.1 Model and Suffix Codes

Before using the indicator, check that the model and suffix codes match your order.

| Model | Suffix Code | | Description |
|---|---|---|---|
| UM350<br>UM330 | | | Digital indicator with Alarms (provided with retransmission output and 15 V DC loop power supply as standard) |
| Type | -0<br>-3 | | Standard type with three alarms<br>Standard type with three alarms (with 24 V DC loop power supply) |
| Optional functions | | 0<br>1<br>2 | None<br>With communication and additional alarm-4<br>With additional alarm-4 |

Check that the following items are provided:

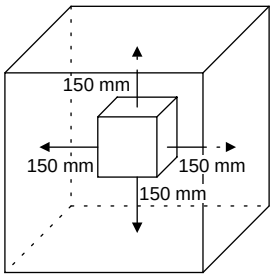
- Digital indicator with alarms (of ordered model) ..... 1
- Brackets (mounting hardware) ..... 1 pair
- Unit label ..... 1
- User's Manuals ..... 3 (A2 size)
- User's Manual (Reference) (CD-ROM version)
  (only for indicators with optional communication functions) ... 1

# 1.2 How to Install

## NOTE

To install the indicator, select a location where:

1. no one may accidentally touch the terminals,
2. mechanical vibrations are minimal,
3. corrosive gas is minimal,
4. temperature can be maintained at about 23° C and the fluctuation is minimal,
5. no direct radiant heat is present,
6. no magnetic disturbances are caused,
7. no wind blows against the terminal board (reference junction compensation element),
8. no water is splashed,
9. no flammable materials are around,




Never place the indicator directly on flammable items or equipment.

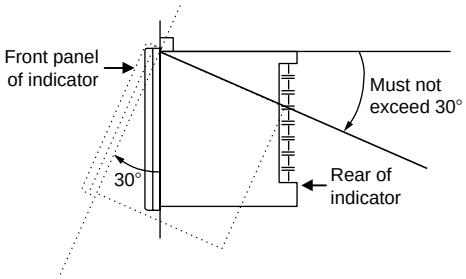
If the indicator has to be installed close to flammable items or equipment, be sure to provide shielding panels all around the indicator, at least 150 mm away from every side; the panels should be made of either 1.43 mm-thick metal-plated steel plates or 1.6 mm-thick uncoated steel plates.

## NOTE

Never touch the opening at the bottom of the case. It is to be used in the factory at shipping.

### ● Installation Position

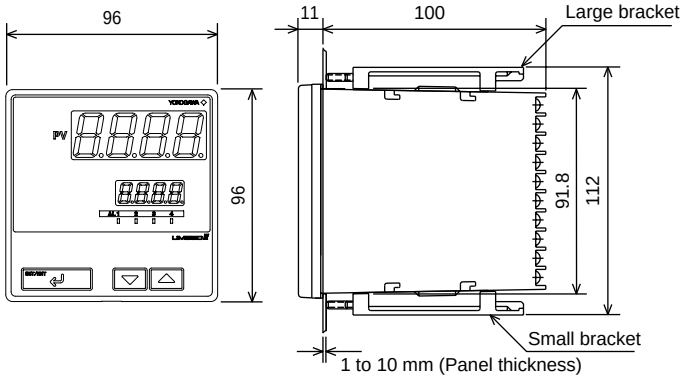
Install the indicator at an angle within 30° from horizontal with the front panel facing upward. Do not install it facing downward. The position of right and left sides should be horizontal.



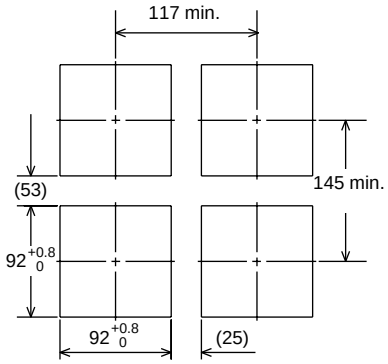
# ■ External Dimensions and Panel Cutout Dimensions

UM350

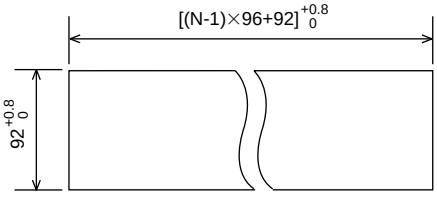
Unit: mm




General installation



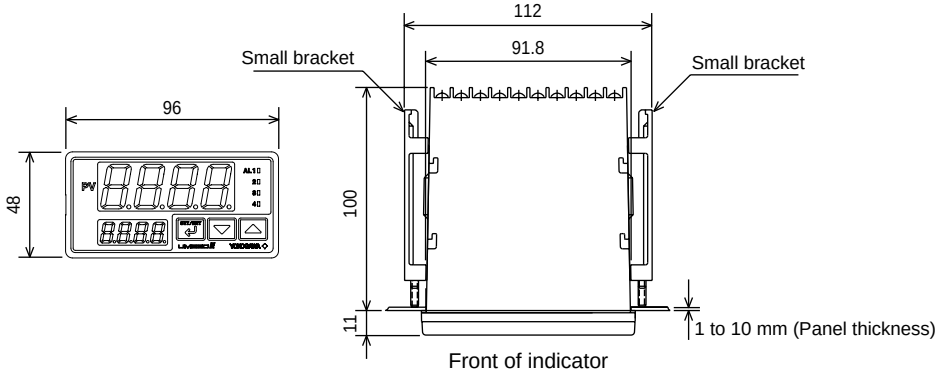

Side-by-side close installation



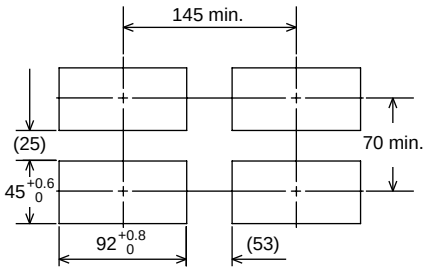

"N" stands for the number of controllers to be installed.
However, the measured value applies if N ≥ 5.

UM330

Unit: mm




General installation



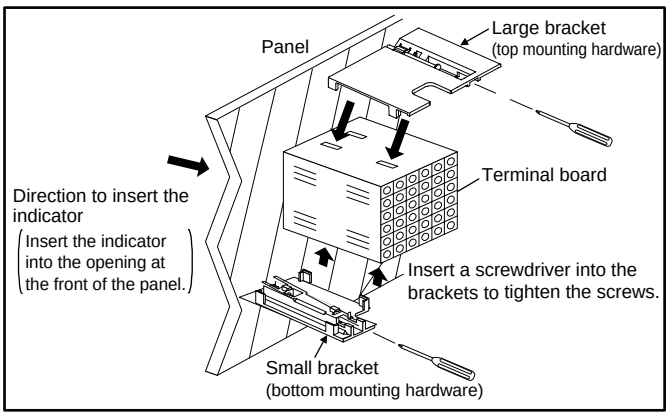
# ■ How to Install

**CAUTION**

Turn off the power to the indicator before installing it on the panel because there is a possibility of electric shock.

After opening the mounting hole on the panel, follow the procedures below to install the indicator:

1. Insert the indicator into the opening from the front of the panel so that the terminal board on the rear is at the far side.
2. Set the brackets in place on the top and bottom of the indicator as shown in the figure below, then tighten the screws of the brackets. Take care not to overtighten them.


Panel
Large bracket
(top mounting hardware)
Terminal board
Direction to insert the indicator
Insert the indicator into the opening at the front of the panel.
Insert a screwdriver into the brackets to tighten the screws.
Small bracket
(bottom mounting hardware)

Note: Right and left mounting for UM330.

# 1.3 How to Connect Wires

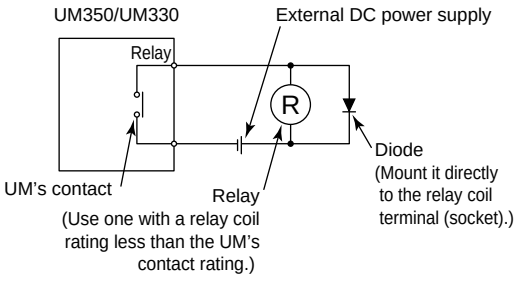
**CAUTION**

1) Before carrying out wiring, turn off the power to the indicator and check that the cables to be connected are not alive with a tester or the like because there is a possibility of electric shock.
2) Wiring must be carried out by personnel who have basic electrical knowledge and practical experience.

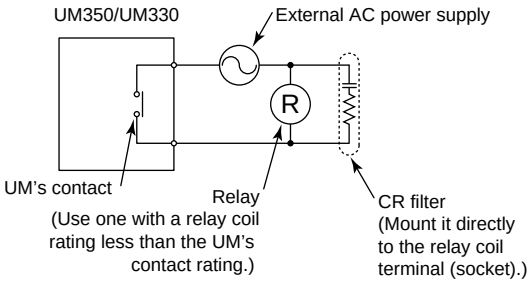
## NOTE

1) Provide power from a single-phase instrument power supply. If there is a lot of noise in the power line, insert an insulating transformer into the primary side of the line and use a line filter (recommended part: ZAC2205-00U from TDK) on the secondary side.
As a countermeasures against noise, do not place the primary and secondary power cables close to each other.
2) For thermocouple input, use shielded compensating lead wires for wiring. For RTD input, use shielded wires that have low conductor resistance and cause no significant differences in resistance between the three wires.
The cables to be used for wiring, terminal specifications, and recommended parts are as shown below.
3) Alarm output relays have a life of 100,000 times that of the resistance load, use auxiliary relays to turn on/off a load.
4) The use of inductance (L) loads such as auxiliary relays, motors and solenoid valves causes malfunction or relay failure; always insert a CR filter for use with alternating current or a diode for use with direct current, as a spark-removal surge suppression circuit, into the line in parallel with the load.
5) When there is possibility of being struck by external lightening surge, use the arrester to protect the instrument.

### ■ For DC Relay Wiring




### ■ For AC Relay Wiring

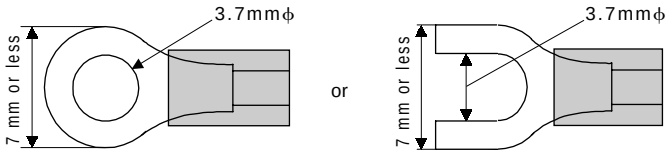

UM350/UM330
External AC power supply
R
UM's contact
Relay
(Use one with a relay coil rating less than the UM's contact rating.)
CR filter
(Mount it directly to the relay coil terminal (socket).)

## ● Cable Specifications and Recommended Cables

| Purpose | Name and Manufacturer |
|---|---|
| Power supply, grounding, relay contact outputs | 600 V PVC insulated wires, JIS C 3307, 0.9 to 2.0 $mm^2$ |
| Thermocouple | Shielded compensating lead wires, JIS C 1610, □X-□-□-□ (See Yokogawa Electric's GS 6B1U1-E.) |
| RTD | Shielded wires (three conductors), UL2482 (Hitachi Cable) |
| Other signals | Shielded wires |

## ● Recommended Terminal Lugs

| Applicable wire size | Tightening torque |
|---|---|
| 0.3 to 1.65 $mm^2$ | 0.8 N·m or less |




## ● Terminal Covers (Optional parts)

| Target Model | Part Number | Sales Unit |
|---|---|---|
| UM350 | T9115YD | 1 |
| UM330 | T9115YE | 1 |

# 1.4 Hardware Specifications

## PV Input Signals

- Number of inputs: 1 (terminals ⑪-⑫-⑬)
- Input type: Universal input system. The input type can be selected with the software.
- Sampling period: 250 ms
- Burnout detection: Functions at TC, RTD, standard signal (0.4 to 2 V or 1 to 5 V)
  Upscale, downscale, and off can be specified.
  For standard signal, burnout is determined to have occurred if it is 0.1 V or less.
- Input bias current: 0.05 μA (for TC or RTD b-terminal)
- Measurement current (RTD): About 0.13 mA
- Input resistance: 1 MΩ or more for thermocouple or mV input
  About 1 MΩ for DC voltage input
- Allowable signal source resistance: 250 Ω or less for thermocouple or mV input
  Effects of signal source resistance: 0.1 μV/Ω or less
  2 kΩ or less for DC voltage input
  Effects of signal source resistance: About 0.01%/100 V
- Allowable wiring resistance: for RTD input
  Maximum 150 Ω/wire: Conductor resistance between three wires should be equal
  However, 10 Ω/wire for a maximum range of -150.0 to 150.0° C.
  Wire resistance effect: ±0.1° C/10 Ω
- Allowable input voltage: ±10 V DC for thermocouple, mV, or RTD input
  ±20 V DC for DC voltage input
- Noise rejection ratio: 40 dB (50/60 Hz) or more in normal mode
  120 dB (50/60 Hz) or more in common mode
- Reference junction compensation error: ±1.0° C (15 to 35° C)
  ±1.5° C (0 to 15° C, 35 to 50° C)
- Applicable standards: JIS, IEC, DIN (ITS-90) for thermocouples and RTD

## Loop Power Supply

Power is supplied to a two-wire transmitter.
(15 V DC: terminals ⑭-⑮; 24 V DC: terminals ㉑-㉒)
A resistor (10 to 250 Ω) connected between the indicator and transmitter converts a current signal into a voltage signal, which is then read via the PV input terminal.
Supply voltage: 14.5 to 18.0 V DC, max. 21 mA (provided with a protection circuit against a field short-circuit); 21.6 to 28.0 V DC, max. 30 mA (only for models with 24 V DC loop power supply)

## Retransmission Output

Outputs the PV value.
Either the retransmission output or the loop power supply can be used with terminals ⑭-⑮.

- Number of outputs: 1 (terminals ⑭-⑮)
- Output signal: 4-20 mA DC
- Load resistance: 600 Ω or less
- Output accuracy: ±0.3% of span under standard operating conditions (23±2° C, 55±10% RH, power frequency of 50/60 Hz)

## Contact Inputs

- Purpose: Resetting of PV peak and bottom values
- Number of inputs: 1
- Input type: Non-voltage contact or transistor open collector input
- Input contact rating: 12 V DC, 10 mA or more
- On/off determination: For non-voltage contact input, contact resistance of 1 kΩ or less is determined as “on” and contact resistance of 20 kΩ or more as “off.”
  For transistor open collector input, input voltage of 2 V or less is determined as “on” and leakage current must not exceed 100 μA when “off.”
- Minimum status detection hold time: About 1 second

## Contact Outputs

- Purpose: Alarm output, FAIL output, and others
- Number of outputs: 4 (Max).
- Relay contact rating for Alarm 1 to 3: 240 V AC, 1 A, or 30 V DC, 1 A; 1a
- Relay contact rating for Alarm 4: 250 V AC, 3 A, or 30 V DC, 3 A (resistance load)
  3 terminals (NC, NO, Common); 1c, (FAIL output : 1b)

## Display Specifications

- PV display: 4-digit, 7-segment red LED display, character height of 20 mm (for both UM350 and UM330)
- Setpoint display: 4-digit, 7-segment, red LEDs, character height of 9.3 mm (for both UM350 and UM330)
- Status indicating lamps: LEDs

## Safety and EMC Standards

- Safety: Compliant with IEC1010-1: 1990 and EN61010-1: 1992
  Approved by CSA1010
  CSA1010 installation category (overvoltage category): CATII (IEC1010-1)
  Approved by UL508
- EMC standards: Complies with EN61326 (the instrument continues to operate at a measuring accuracy of within ±20% of the range during tests):

## Construction, Installation, and Wiring

- Construction: Only the front panel is dust-proof and drip-proof (protection class IP55) For side-by-side close installation the controller loses its dust-proof and drip-proof protection.
- Material: ABS resin and polycarbonate
- Case color: Black
- Weight: About 1 kg or less
- Dimensions:
  UM350 —96 (W) ×96 (H) ×100 (depth from panel face) mm
  UM330 —96 (W) ×48 (H) ×100 (depth from panel face) mm
- Installation: Panel-mounting type. With top and bottom (or right and left) mounting hardware (1 each)
- Panel cutout dimensions:
  UM350 $-92^{+0.8}_{0}$ (W) $\times 92^{+0.8}_{0}$ (H) mm
  UM330 $-92^{+0.8}_{0}$ (W) $\times 45^{+0.6}_{0}$ (H) mm
- Installation position: Up to 30° upward facing (not designed for facing downward)
- Wiring: M3.5 screw terminals (for signal wiring and power/ground wiring as well)

## Power Supply Specifications

- Power supply: Rated voltage of 100 to 240 V AC (±10%), 50/60 Hz
- Power consumption: Max. 20 VA (8.0 W max.)
- Internal fuse rating: 250 VAC, 1.6A time-lug fuse
- Data backup: Non-volatile memory (can be written to up to 100,000 times)
- Withstanding voltage
  - Between primary terminals* and secondary terminals**:
    At least 1500 V AC for 1 minute (Note)
  - Between primary terminals* and grounding terminal:
    At least 1500 V AC for 1 minute (Note)
  - Between grounding terminal and secondary terminals**:
    At least 1500 V AC for 1 minute
  - Between secondary terminals**:
    At least 500 V AC for 1 minute

  Note: The withstanding voltage is specified as 2300 V AC per minute to provide a margin of safety.

  * Primary terminals indicate power terminals and relay output terminals

  ** Secondary terminals indicate analog I/O signal, and contact input terminals
- Insulation resistance: 20 MΩ or more at 500 V DC between power terminals and grounding terminal
- Grounding: Class 3 grounding (grounding resistance of 100 Ω or less)

## Signal Isolations

- PV input terminals: Isolated from other input/output terminals. Not isolated from internal circuit.
- 15 V DC loop power supply terminals: Not isolated from 4-20 mA analog output. Isolated from other input/output terminals and internal circuit.
- 24 V DC loop power supply terminals: Isolated from 4-20 mA analog output terminals, other input/output terminals and internal circuit.
- 4-20 mA analog output terminals (for retransmission): Not isolated from 15 V DC loop power supply. Isolated from other input/output terminals and internal circuit.
- Contact input terminals: Not isolated from communication terminals. Isolated from other input/output terminals and internal circuit.
- Relay contact output terminals: Not isolated between relay contact output terminals. Isolated from other input/output terminals and internal circuit.
- RS-485 communication terminals: Not isolated from contact input terminals. Isolated from other input/output terminals and internal circuit.
- Power terminals: Isolated from other input/output terminals and internal circuit.
- Grounding terminals: Isolated from other input/output terminals and internal circuit.

## Environmental Conditions

- Normal operating conditions:
  Ambient temperature: 0 to 50° C (40° C or less for side-by-side close installation)
  0 to 40° C if the 24 V DC loop power supply of Model UM330 is used
  Temperature change rate: 10° C/h or less
  Ambient humidity: 20 to 90% RH (no condensation allowed)
  Magnetic field: 400 A/m or less
  Continuous vibration at 5 to 14 Hz: Full amplitude of 1.2 mm or less
  Continuous vibration at 14 to 150 Hz: 4.9 $m/s^2$ or less
  Short-period vibration: 14.7 $m/s^2$, 15 seconds or less
  Shock: 147 $m/s^2$ or less, 11 ms
  Installation height: Height above sea level of 2000 m or less
  Warm-up time: 30 minutes or more after power on
- Transportation and storage conditions:
  Temperature: -25 to 70° C
  Temperature change rate: 20° C/h or less
  Humidity: 5 to 95% RH (no condensation allowed)
- Effects of changes in operating conditions
  - Effects from changes in ambient temperature:
    - On voltage or thermocouple input, ±1 μV/° C or ±0.01% of F.S./° C, whichever is larger
    - On RTD input, ±0.05° C/° C (ambient temperature) or less
    - On analog output, ±0.05% of F.S./° C or less
  - Effects from power supply fluctuation (within rated voltage range)
    - On analog input, ±1 μV/10 V or ±0.01% of F.S./10 V, whichever is larger
    - On analog output, ±0.05% of F.S./10 V or less

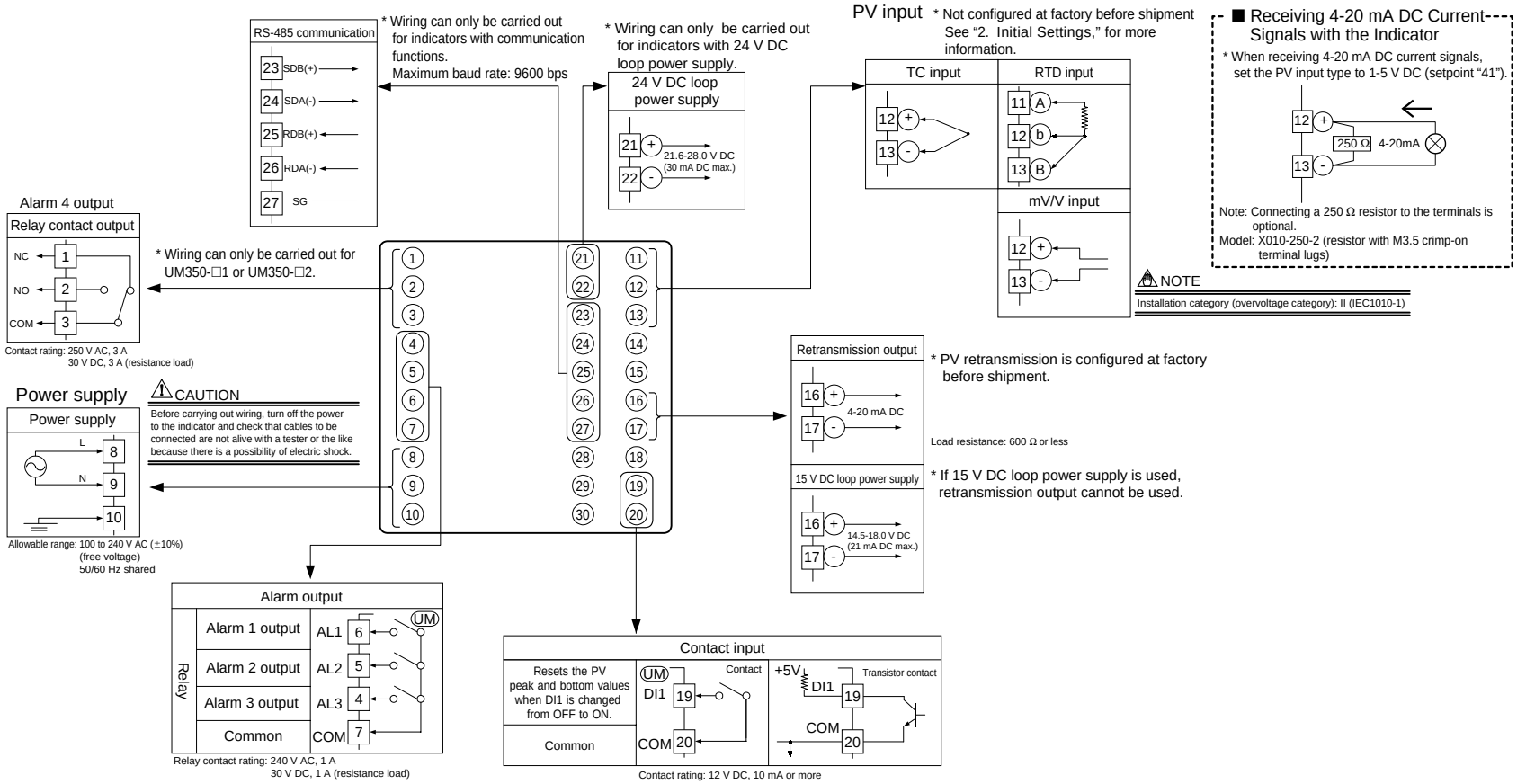
# 1.5 Terminal Wiring Diagrams

## NOTE

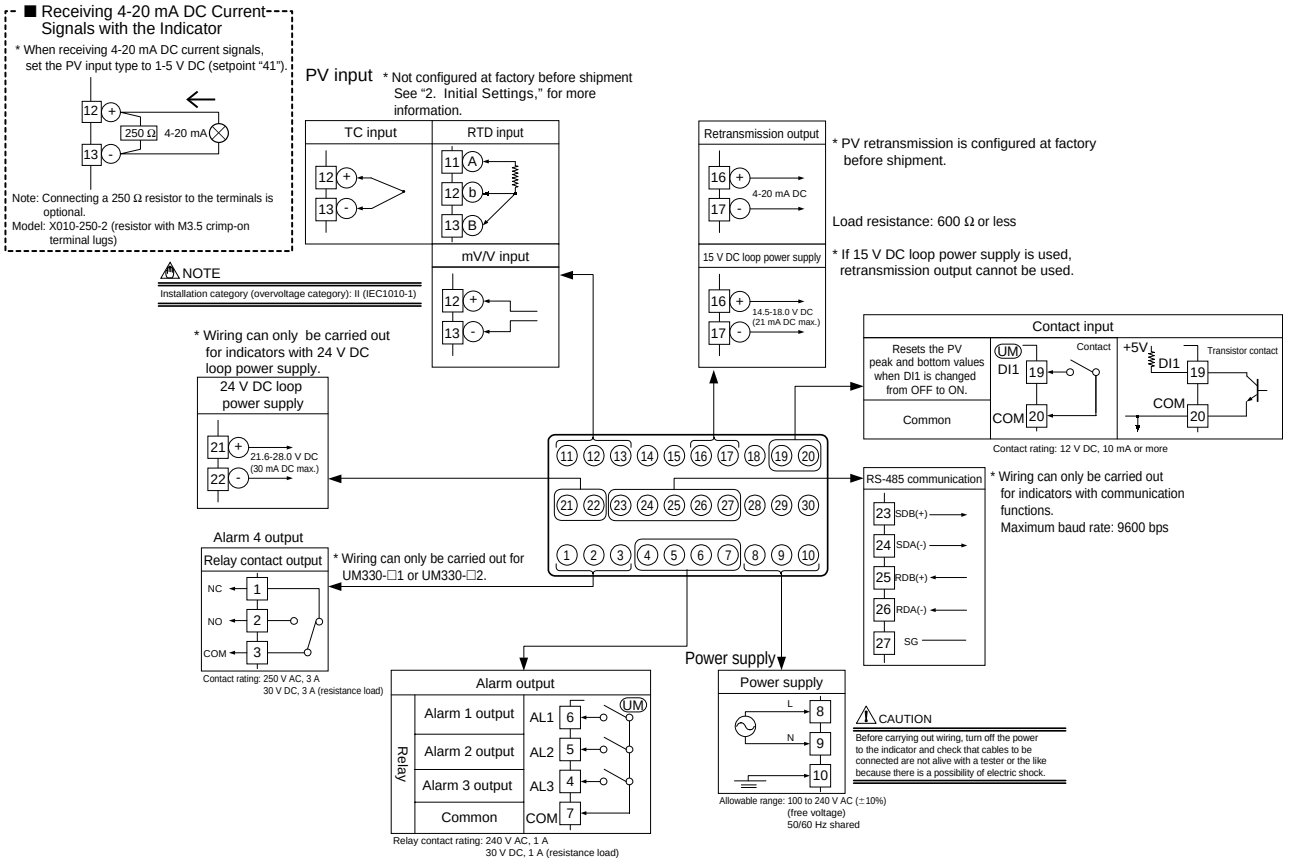
Do not use unassigned terminals as relay terminals.

Terminal wiring diagrams are shown on and after the next page.

# ■ UM350 Standard Type (Model UM350-0□ or UM350-3□)


RS-485 communication
23 SDB(+)
24 SDA(-)
25 RDB(+)
26 RDA(-)
27 SG
* Wiring can only be carried out for indicators with communication functions.
Maximum baud rate: 9600 bps
* Wiring can only be carried out for indicators with 24 V DC loop power supply.
24 V DC loop power supply
21 +
22 -
21.6-28.0 V DC
(30 mA DC max.)
PV input
* Not configured at factory before shipment
See "2. Initial Settings," for more information.
TC input
RTD input
mV/V input
12 +
13 -
11 A
12 b
13 B
■ Receiving 4-20 mA DC Current Signals with the Indicator
* When receiving 4-20 mA DC current signals, set the PV input type to 1-5 V DC (setpoint "41").
250 Ω
4-20mA
Note: Connecting a 250 Ω resistor to the terminals is optional.
Model: X010-250-2 (resistor with M3.5 crimp-on terminal lugs)
NOTE
Installation category (overvoltage category): II (IEC1010-1)
Alarm 4 output
Relay contact output
NC 1
NO 2
COM 3
Contact rating: 250 V AC, 3 A
30 V DC, 3 A (resistance load)
* Wiring can only be carried out for UM350-□1 or UM350-□2.
Power supply
Power supply
L 8
N 9
10
Allowable range: 100 to 240 V AC (±10%)
(free voltage)
50/60 Hz shared
CAUTION
Before carrying out wiring, turn off the power to the indicator and check that cables to be connected are not alive with a tester or the like because there is a possibility of electric shock.
Retransmission output
16 +
17 -
4-20 mA DC
Load resistance: 600 Ω or less
* PV retransmission is configured at factory before shipment.
15 V DC loop power supply
14.5-18.0 V DC
(21 mA DC max.)
* If 15 V DC loop power supply is used, retransmission output cannot be used.
Alarm output
Relay
Alarm 1 output
Alarm 2 output
Alarm 3 output
Common
AL1 6
AL2 5
AL3 4
COM 7
UM
Relay contact rating: 240 V AC, 1 A
30 V DC, 1 A (resistance load)
Contact input
Resets the PV peak and bottom values when DI1 is changed from OFF to ON.
Common
UM
DI1 19
COM 20
Contact
+5V
Transistor contact
Contact rating: 12 V DC, 10 mA or more

# ■ UM330 Standard Type (Model UM330-0□ or UM330-3□)


■ Receiving 4-20 mA DC Current Signals with the Indicator
* When receiving 4-20 mA DC current signals, set the PV input type to 1-5 V DC (setpoint "41").
12
13
250 Ω
4-20 mA
Note: Connecting a 250 Ω resistor to the terminals is optional.
Model: X010-250-2 (resistor with M3.5 crimp-on terminal lugs)
PV input
* Not configured at factory before shipment See "2. Initial Settings," for more information.
TC input
RTD input
mV/V input
NOTE
Installation category (overvoltage category): II (IEC1010-1)
* Wiring can only be carried out for indicators with 24 V DC loop power supply.
24 V DC loop power supply
21.6-28.0 V DC (30 mA DC max.)
Retransmission output
4-20 mA DC
* PV retransmission is configured at factory before shipment.
Load resistance: 600 Ω or less
15 V DC loop power supply
14.5-18.0 V DC (21 mA DC max.)
* If 15 V DC loop power supply is used, retransmission output cannot be used.
Contact input
Resets the PV peak and bottom values when DI1 is changed from OFF to ON.
Common
UM
DI1
COM
Contact
Transistor contact
+5V
Contact rating: 12 V DC, 10 mA or more
RS-485 communication
SDB(+)
SDA(-)
RDB(+)
RDA(-)
SG
* Wiring can only be carried out for indicators with communication functions.
Maximum baud rate: 9600 bps
Alarm 4 output
Relay contact output
NC
NO
COM
* Wiring can only be carried out for UM330-□1 or UM330-□2.
Contact rating: 250 V AC, 3 A
30 V DC, 3 A (resistance load)
Alarm output
Alarm 1 output
Alarm 2 output
Alarm 3 output
Common
AL1
AL2
AL3
Relay
Relay contact rating: 240 V AC, 1 A
30 V DC, 1 A (resistance load)
Power supply
L
N
Allowable range: 100 to 240 V AC (±10%)
(free voltage)
50/60 Hz shared
CAUTION
Before carrying out wiring, turn off the power to the indicator and check that cables to be connected are not alive with a tester or the like because there is a possibility of electric shock.
* Wiring can only be carried out for indicators with 24 V DC loop power supply.
■ 15 V DC Power Supply Wiring to Two-wire Sensor
External resistor (Note)
100 Ω
PV input
0.4 to 2.0 V DC signal
Two-wire transmitter
4-20 mA DC
Loop power supply
14.5 to 18.0 V DC
Note: Connecting a 100 Ω resistor to the terminals is optional.
Model: X010-100-2 (resistor with M3.5 crimp-on terminal lugs)
■ 24 V DC Power Supply Wiring to Two-wire Sensor
250 Ω
1 to 5 V DC signal
21.6 to 28.0 V DC
Note: Connecting a 250 Ω resistor to the terminals is optional.
Model: X010-250-2 (resistor with M3.5 crimp-on terminal lugs)

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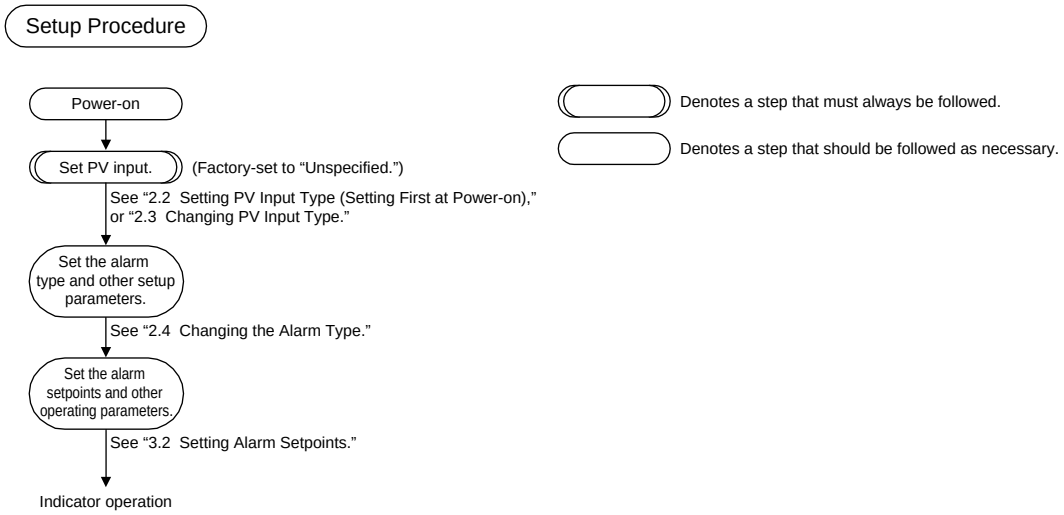
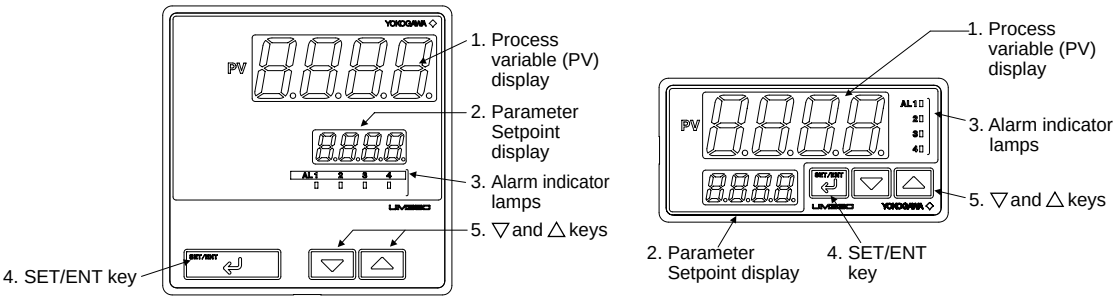
# 2. Initial Settings

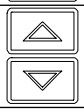
**This chapter describes examples of setting the types of PV input and alarm. Carrying out settings described herein allows you to perform basic monitoring. Refer to examples of various settings to understand how to set parameters required. Refer to "5.1 Parameter Map" for an easy to understand explanation of setting various parameters. If you cannot remember how to carry out an operation during setting, press the SET/ENT key for more than 3 seconds. This brings you to the display (operating display) that appears at power-on.**


Setup Procedure
Power-on
Set PV input.
(Factory-set to "Unspecified.")
See "2.2 Setting PV Input Type (Setting First at Power-on)," or "2.3 Changing PV Input Type."
Set the alarm type and other setup parameters.
See "2.4 Changing the Alarm Type."
Set the alarm setpoints and other operating parameters.
See "3.2 Setting Alarm Setpoints."
Indicator operation
Denotes a step that must always be followed.
Denotes a step that should be followed as necessary.

The following explanation of operation for the UM350's panel, shown in the figure, is the same as that of the UM330's panel.

# 2.1 Names and Functions of Front Panel Parts




| | Name of Part | Function |
|---|---|---|
| 1. | Process variable (PV) display | • Displays a PV value during operation.<br>• Displays a parameter symbol when you set a parameter.<br>• Displays an error code in red if the indicator fails. |
| 2. | Parameter setpoint display | Displays the setpoint of a parameter when it is configured. |
| 3. | Alarm indicator lamps | If any of alarms 1 to 4 occurs, the respective alarm indicator lamp (AL1 to AL4) is lit (in orange). |
| 4. | SET/ENT key | Used to switch or register a parameter. Pressing the key for more than 3 seconds allows you to switch between the operating display and the menu for operating parameter setting display alternately. |
| 5. | ▽and △ keys  | Used to change numerical values. On setting displays for various parameters, you can change parameters. Pressing the ▽ key decreases a numerical value, while pressing the △ key causes it to increase. You can hold down a key to gradually increase the speed of change. |

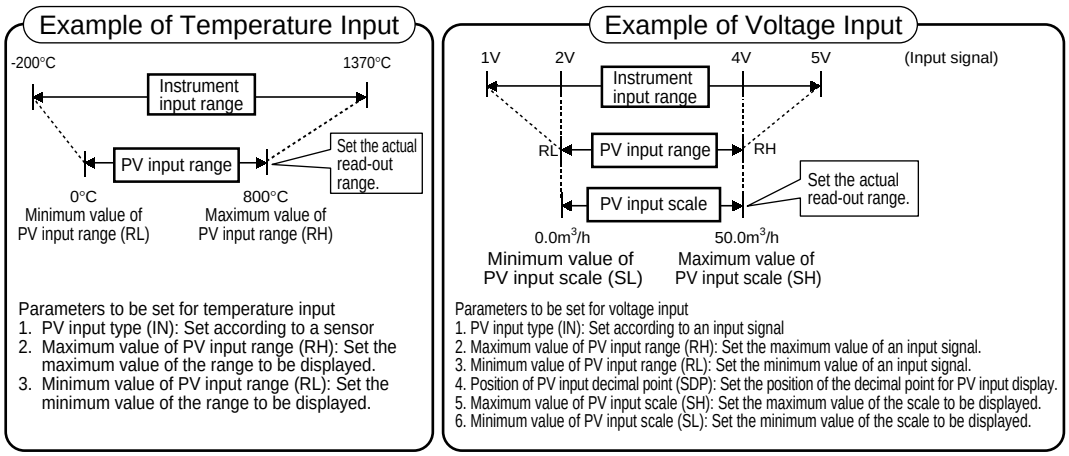
## IMPORTANT

The indicator automatically returns to the display at the time of power-on (i.e., Operating display) if no key is operated for at least one minute.

# 2.2 Setting PV Input Type (Setting First at Power-on)

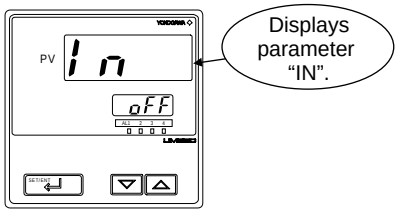
## NOTE

- The indicator displays the operating display when the power is turned on. However, if PV input type has not been set, “IN” appears. In this case, first use the ▲ key to display the input range code to use, then press the SET/ENT key to register it. Then, set the maximum value (RH) and minimum value (RL) of the PV input range (for voltage input, set the maximum value (SH) and minimum value (SL) of the PV input scale).
- The indicator is configured to the initial value of each parameter at the factory before shipment.
  First check the initial values shown in “5.2 Lists of Parameters,” and change parameter values as necessary.

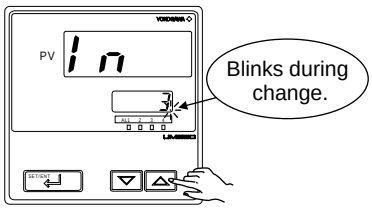

Example of Temperature Input
-200°C
1370°C
Instrument input range
PV input range
Set the actual read-out range.
0°C
Minimum value of PV input range (RL)
800°C
Maximum value of PV input range (RH)
Parameters to be set for temperature input
1. PV input type (IN): Set according to a sensor
2. Maximum value of PV input range (RH): Set the maximum value of the range to be displayed.
3. Minimum value of PV input range (RL): Set the minimum value of the range to be displayed.
Example of Voltage Input
1V
2V
4V
5V
(Input signal)
Instrument input range
RL
PV input range
RH
PV input scale
Set the actual read-out range.
0.0m3/h
Minimum value of PV input scale (SL)
50.0m3/h
Maximum value of PV input scale (SH)
Parameters to be set for voltage input
1. PV input type (IN): Set according to an input signal
2. Maximum value of PV input range (RH): Set the maximum value of an input signal.
3. Minimum value of PV input range (RL): Set the minimum value of an input signal.
4. Position of PV input decimal point (SDP): Set the position of the decimal point for PV input display.
5. Maximum value of PV input scale (SH): Set the maximum value of the scale to be displayed.
6. Minimum value of PV input scale (SL): Set the minimum value of the scale to be displayed.

The following operating procedure describes an example of setting a K-type thermocouple (-199.9° C to 500.0° C) and a measurement range of 0.0° C to 200.0° C.

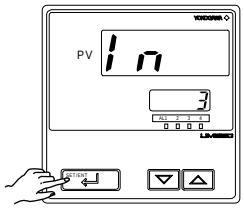
**1. Display screen at power-on**
**The parameter “IN” for setting the PV input type appears.**



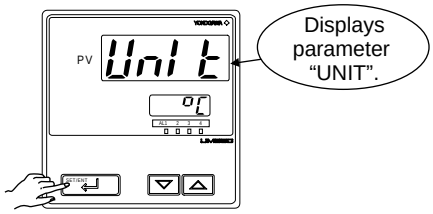

**2. Press the ▲ or ▼ key to display the required setpoint.**
**The figure below shows an example of setting a K-type thermocouple (-199.9 to 500.0°C). See the Instrument Input Range Codes.**



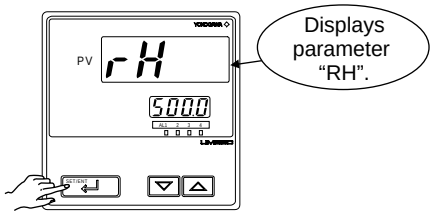
**3.** **Press the SET/ENT key once to register the setpoint.**



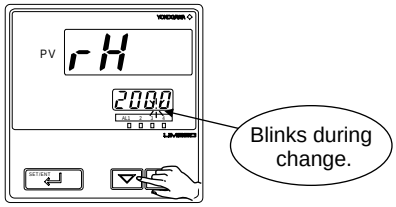

**4.** **Press the SET/ENT key once to display the parameter "UNIT" (PV input unit).**



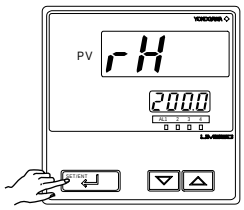

**5.** **Press the SET/ENT key once to display the parameter "RH" (maximum value of PV input range).**



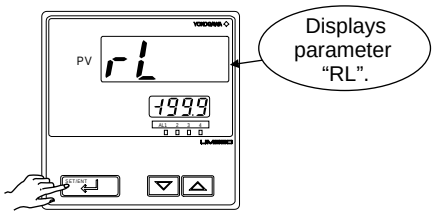

**6.** **Press the ▲ or ▼ key to display the required setpoint. The figure below shows an example of setting the maximum value of PV input range to 200.0°C.**



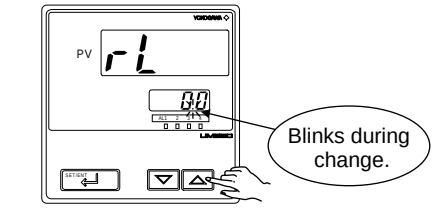

**7.** **Press the SET/ENT key once to register the setpoint.**



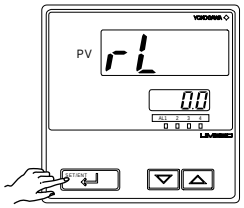

**8.** **Press the SET/ENT key once to display the parameter "RL" (minimum value of PV input range).**




**9.** **Press the ▲ or ▼ key to display the required setpoint. The figure below shows an example of setting the minimum value of PV input range to 0.0°C.**

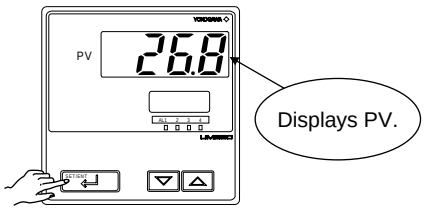



**10.** **Press the SET/ENT key once to register the setpoint.**




**If the type of input is voltage, also configure the PV Input Decimal Point Position (SDP), Maximum Value of PV Input Scale (SH), and Minimum Value of PV Input Scale (SL) parameters that are displayed after this.**

**11.** **Press the SET/ENT key for more than 3 seconds. This returns you to the display shown at power-on (figure below).**




**The PV display in the figure above shows the error code for input burnout ( boUt ) if PV input wiring is not yet complete. The error code disappears when you wire the PV input terminals correctly.**

# ■ Instrument Input Range Codes

Selected the unit from UNIT parameter.

| Input | Type | Instrument Input Range Code | Instrument Input Range | Measurement Accuracy |
|---|---|---|---|---|
| Unspecified | | OFF | Set the data item PV Input Type "IN" to the OFF option to leave the PV input type undefined. | |
| Thermocouple | K | 1 | -200 to 1370°C<br>-300 to 2500°F | ±0.1% of instrument range ±1 digit for temperatures equal to or higher than 0°C<br>±0.2% of instrument range ±1 digit for temperatures below 0°C |
| | | 2 | -199.9 to 999.9°C<br>0 to 2300°F | |
| | | 3 | -199.9 to 500.0°C<br>-199.9 to 999.9°F | |
| | J | 4 | -199.9 to 999.9°C<br>-300 to 2300°F | |
| | T | 5 | -199.9 to 400.0°C<br>-300 to 750°F | |
| | | 6 | 0.0 to 400.0°C<br>-199.9 to 750.0°F | |
| | B | 7 | 0 to 1800°C<br>32 to 3300°F | ±0.15% of instrument range ±1 digit for temperatures equal to or higher than 400°C<br>±5% of instrument range ±1 digit for temperatures below 400°C |
| | S | 8 | 0 to 1700°C<br>32 to 3100°F | ±0.15% of instrument range ±1 digit |
| | R | 9 | 0 to 1700°C<br>32 to 3100°F | |
| | N | 10 | -200 to 1300°C<br>-300 to 2400°F | ±0.1% of instrument range ±1 digit<br>±0.25% of instrument range ±1 digit for temperatures below 0°C |
| | E | 11 | -199.9 to 999.9°C<br>-300 to 1800°F | ±0.1% of instrument range ±1 digit for temperatures equal to or higher than 0°C<br>±0.2% of instrument range ±1 digit for temperatures below 0°C |
| | L(DIN) | 12 | -199.9 to 900.0°C<br>-300 to 1300°F | |
| | U(DIN) | 13 | -199.9 to 400.0°C<br>-300 to 750°F | |
| | | 14 | 0.0 to 400.0°C<br>-199.9 to 750.0°F | |
| | W | 15 | 0 to 2300°C<br>32 to 4200°F | ±0.2% of instrument range ±1 digit |
| | Platinel 2 | 16 | 0 to 1390°C<br>32 to 2500°F | ±0.1% of instrument range ±1 digit |
| | PR20-40 | 17 | 0 to 1900°C<br>32 to 3400°F | ±0.5% of instrument range ±1 digit for temperatures equal to or higher than 800°C<br>No guarantee of accuracy for temperatures below 800°C |
| | W97Re3-W75Re25 | 18 | 0 to 2000°C<br>32 to 3600°F | ±0.2% of instrument range ±1 digit |
| RTD | JPt100 | 30 | -199.9 to 500.0°C<br>-199.9 to 999.9°F | ±0.1% of instrument range ±1 digit (Note 1) (Note 2) |
| | | 31 | -150.0 to 150.0°C<br>-199.9 to 300.0°F | ±0.2% of instrument range ±1 digit (Note 1) |
| | Pt100 | 35 | -199.9 to 850.0°C<br>-300 to 1560°F | ±0.1% of instrument range ±1 digit (Note 1) (Note 2) |
| | | 36 | -199.9 to 500.0°C<br>-199.9 to 999.9°F | |
| | | 37 | -150.0 to 150.0°C<br>-199.9 to 300.0°F | ±0.2% of instrument range ±1 digit (Note 1) |
| Standard signal | 0.4 to 2 V | 40 | 0.400 to 2.000 V | ±0.1% of instrument range ±1 digit<br>The read-out range can be scaled between -1999 and 9999. |
| | 1 to 5 V | 41 | 1.000 to 5.000 V | |
| DC voltage | 0 to 2 V | 50 | 0.000 to 2.000 V | |
| | 0 to 10 V | 51 | 0.00 to 10.00 V | |
| | -10 to 20 mV | 55 | -10.00 to 20.00 mV | |
| | 0 to 100 mV | 56 | 0.0 to 100.0 mV | |

* Performance in the standard condition (at 23±2°C, 55±10%RH, and 50/60 Hz power frequency.
Note 1: The accuracy is ±0.3°C of instrument range ±1 digit for a temperature range from 0°C to 100°C.
Note 2: The accuracy is ±0.5°C of instrument range ±1 digit for a temperature range from -100°C to 200°C.
* To receive a 4-20 mA DC signal, select a standard signal of 1 to 5 V DC and connect it to a 250 Ω resistor. This resistor is optional.
Model: X010-250-2 (resistor with M3.5 crimp-on terminal lugs)

## NOTE

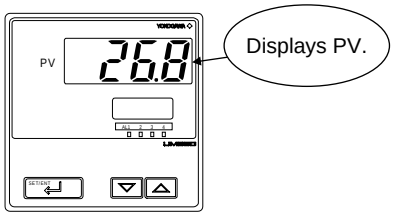
The indicator may automatically initialize the registered operating parameter setpoints if any change is made to the data item PV Input Type (IN), Maximum Value of PV Input Range (RH), Minimum Value of PV Input Range (RL), PV Input Decimal Point Position (SDP), Maximum Value of PV Input Scale (SH) or Minimum Value of PV Input Scale (SL). After a change has been made to any of these data items, be sure to verify the registered operating parameter setpoints to ensure that they are correct. If any data item has been changed to its default, set it to a required value.

# 2.3 Changing PV Input Type

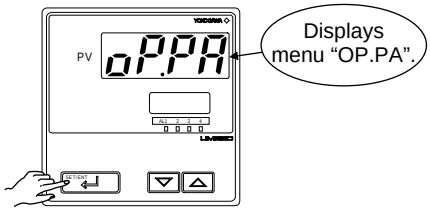
The following operating procedure describes an example of changing the setting of K-type thermocouple (-199.9 to 500.0° C) to RTD Pt100 (-199.9 to 500.0° C) and a measurement range of 0.0 to 200.0° C.

PV input terminal
Thermocouple/mV/V input..... ⑫-⑬
RTD input ..... ⑪-⑫-⑬

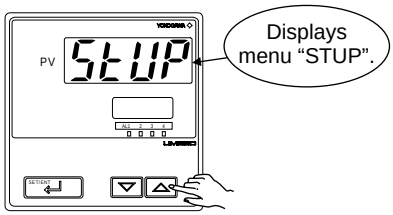
**1. Bring the operating display into view (display appears at power on).**



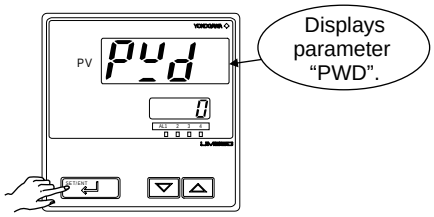

**2. Press the SET/ENT key for more than 3 seconds to call up the menu "OP.PA".**



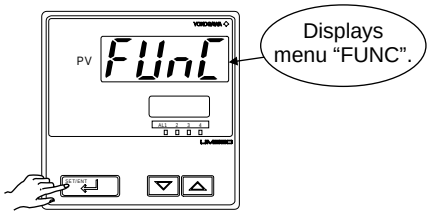

**3. Press the △ key once to display the menu "STUP".**



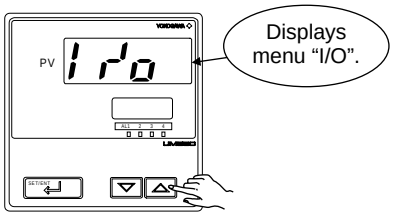

**4. Press the SET/ENT key once to display the parameter "PWD".**



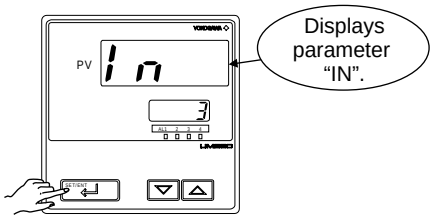

**5. Press the SET/ENT key once to display the menu "FUNC".**



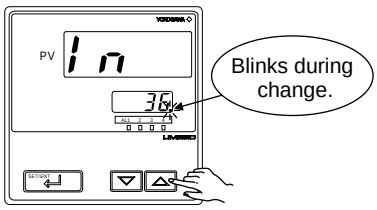

**6. Press the △ key once to display the menu "I/O".**



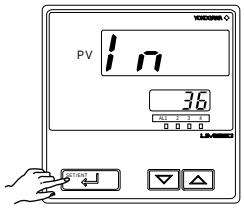

**7. Press the SET/ENT key once to display the parameter "IN" (PV input type).**



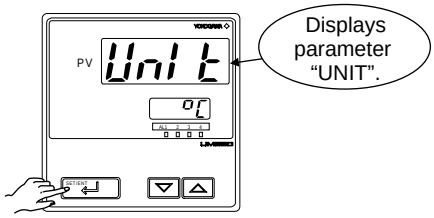

**8. Press the △ or ▽ key to display the required setpoint. The figure below shows an example of changing to RTD Pt100 (-199.9 to 500.0°C).**



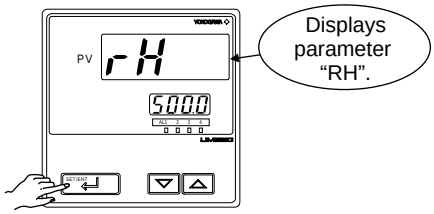
**9.** **Press the SET/ENT key once to register the setpoint.**



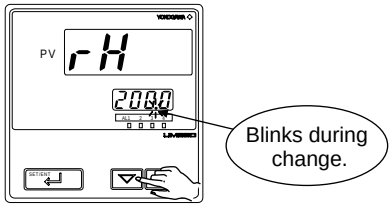

**10.** **Press the SET/ENT key once to display the parameter "UNIT" (PV input unit).**



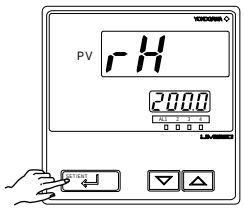

**11.** **Press the SET/ENT key once to display the parameter "RH" (maximum value of PV input range).**



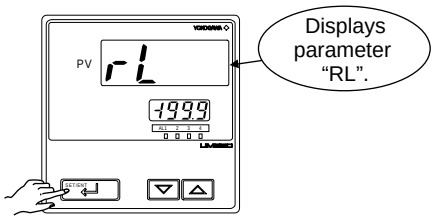

**12.** **Press the ▲ or ▼ key to display the required setpoint. The figure below shows an example of setting the maximum value of PV input range to 200.0°C.**



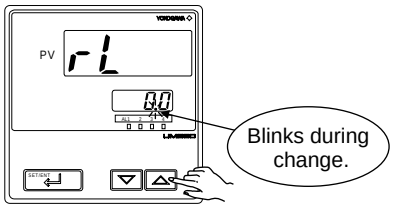

**13.** **Press the SET/ENT key once to register the setpoint.**



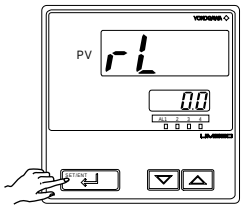

**14.** **Press the SET/ENT key once to display the parameter "RL" (minimum value of PV input range).**



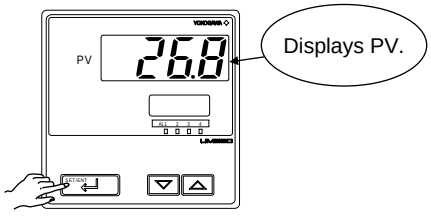

**15.** **Press the ▲ or ▼ key to display the required setpoint. The figure below shows an example of setting the minimum value of PV input range to 0.0°C.**




**16.** **Press the SET/ENT key once to register the setpoint.**




**17.** **Press the SET/ENT key for more than 3 seconds.**
**This returns you to the display shown at power-on (figure below).**




*** If the type of input is voltage, also configure the PV Input Decimal Point Position (SDP), Maximum Value of PV Input Scale (SH), and Minimum Value of PV Input Scale (SL) parameters that are displayed after this.**

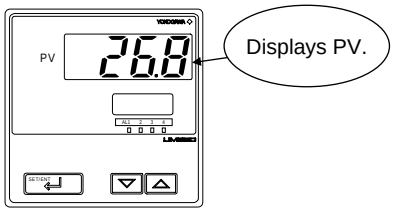
# 2.4 Changing Alarm Type

The following operating procedure describes an example of changing alarm-1 (factory-set default: PV high limit alarm) to PV low limit alarm.

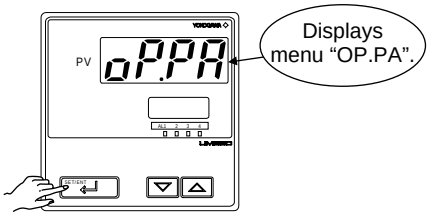
When you have changed alarm type, the alarm setpoint will be initialized; set the alarm setpoint again.

| Alarm output terminals | Factory-set defaults |
|---|---|
| Alarm-1 (terminal numbers ⑥-⑦) | PV high limit alarm |
| Alarm-2 (terminal numbers ⑤-⑦) | PV low limit alarm |
| Alarm-3 (terminal numbers ④-⑦) | PV high limit alarm |
| Alarm-4 (terminal numbers ①-②-③) | PV low limit alarm |

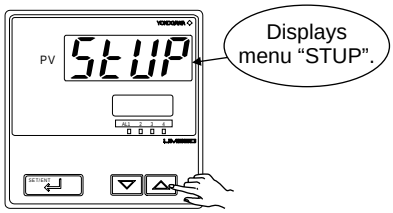
**1. Bring the operating display into view (appears at power-on).**



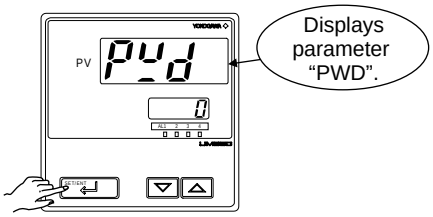

**2. Press the SET/ENT key for more than 3 seconds to call up the menu "OP.PA".**



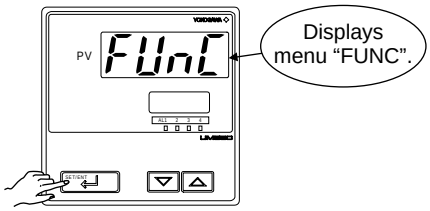

**3. Press the ▲ key once to display the menu "STUP".**



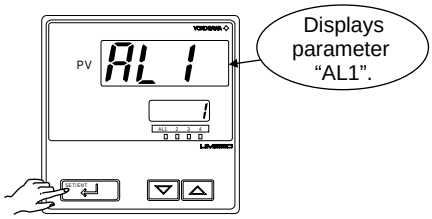

**4. Press the SET/ENT key once to display the parameter "PWD".**



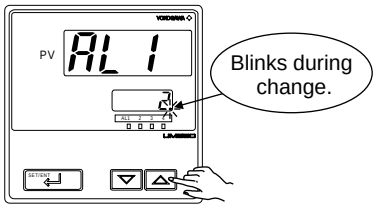

**5. Press the SET/ENT key once to display the menu "FUNC".**



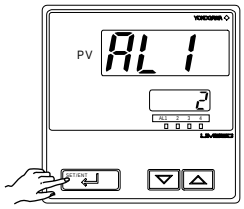

**6. Press the SET/ENT key once to display the parameter "AL1" (alarm-1 type).**




**7. Press the ▲ or ▼ key to display the required setpoint. The figure below shows an example of setting PV low limit alarm.**

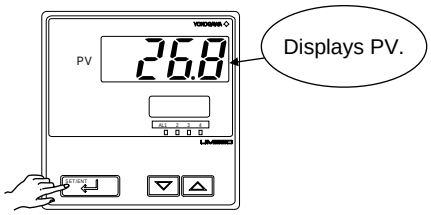


**8.** **Press the SET/ENT key once to register the setpoint.**




**You can take the same steps for alarm-2 type (AL2), alarm-3 type (AL3), and alarm-4 type (AL4) that are displayed after this.**

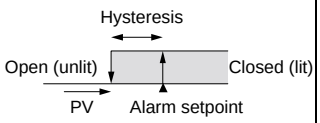
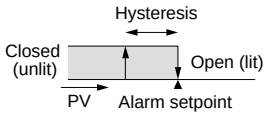
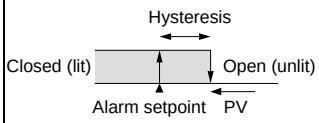
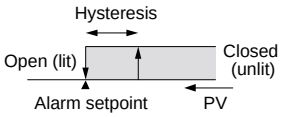
**9.** **Press the SET/ENT key for more than 3 seconds. This returns you to the display shown at power-on (figure below).**




**See "3.2 Setting Alarm Setpoints" when setting an alarm setpoint.**

## ■ List of Alarm Types

The table below shows the alarm types and alarm actions.
In the table, codes 1, 2, 9, and 10 are not provided with stand-by actions, while codes 11, 12, 19, and 20 are provided with stand-by actions.

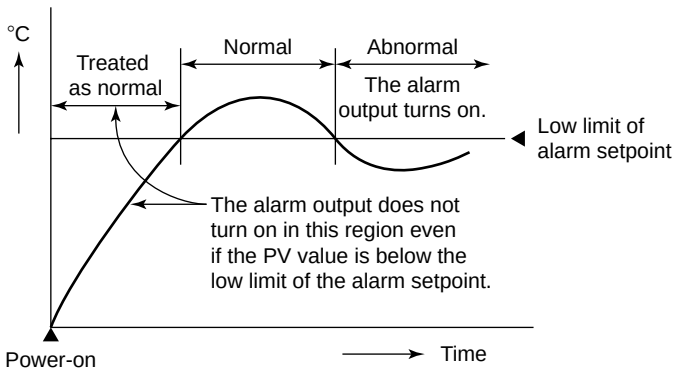
| Alarm type | Alarm action<br>"Open/close" shows status of relay contact, and "lit" and "unlit" shows status of lamp | Alarm type code<br>Contact closes if alarm occurs | Alarm type code<br>Contact opens if alarm occurs | Alarm type | Alarm action<br>"Open/close" shows status of relay contact, and "lit" and "unlit" shows status of lamp | Alarm type code<br>Contact closes if alarm occurs | Alarm type code<br>Contact opens if alarm occurs |
|---|---|---|---|---|---|---|---|
| No alarm | | OFF | | | | | |
| PV high limit |  | 1<br>11 | | De-energized on PV high limit |  | | 9<br>19 |
| PV low limit |  | 2<br>12 | | De-energized on PV low limit |  | | 10<br>20 |
| Fault diagnosis output (Note 1) | | 21 | | FAIL output (Note 2) | | | 22 |

Note 1: Fault diagnosis output
Turns on in case of input burnout, A/D converter failure, or reference junction compensation (RJC) failure.
Note 2: FAIL output
Turns off in case of program failure, ROM failure, RAM failure, or power failure. This output is on during normal operation.
If it turns off, the retransmission output is set to 0%, the alarm output is set to OFF, and the indicator stops.

### Stand-by Action

It is effective in the following cases where;

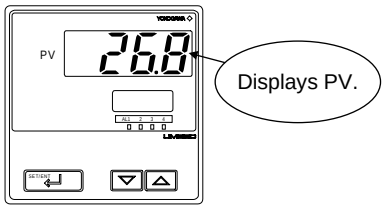
- the power is turned on
- the alarm type is changed


°C
Treated as normal
Normal
Abnormal
The alarm output turns on.
Low limit of alarm setpoint
The alarm output does not turn on in this region even if the PV value is below the low limit of the alarm setpoint.
Power-on
Time

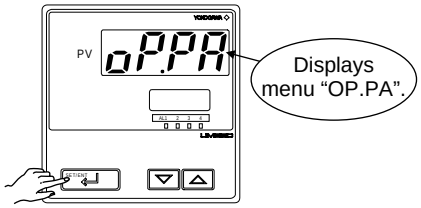
# 2.5 Setting Hysteresis in Alarm Setpoint

The following operating procedure describes an example of setting a 5.0°C hysteresis level in the alarm setpoint.

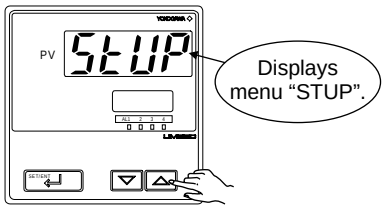
**1. Bring the operating display into view (appears at power-on).**



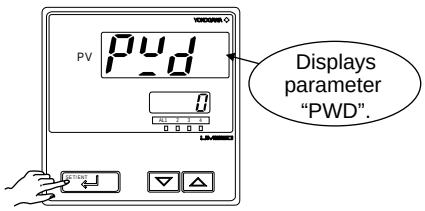

**2. Press the SET/ENT key for more than 3 seconds to call up the menu "OP.PA".**



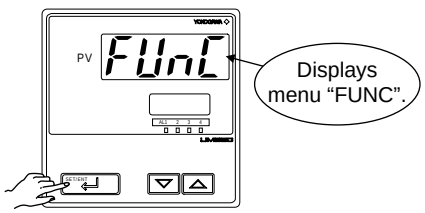

**3. Press the ▲ key once to display the menu "STUP".**



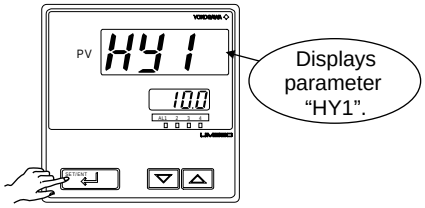

**4. Press the SET/ENT key once to display the parameter "PWD".**



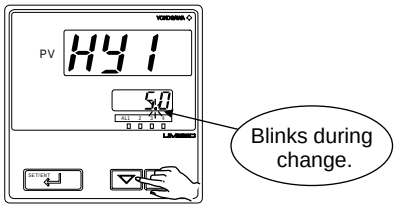

**5. Press the SET/ENT key once to display the menu "FUNC".**



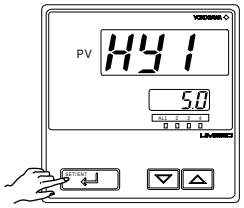

**6. Press the SET/ENT key several times to display the parameter "HY1" (alarm-1 hysteresis).**




**7. Press the ▲ or ▼ key to display the required setpoint.**

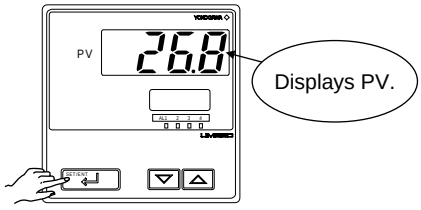



**8. Press the SET/ENT key once to register the setpoint.**




**You can take the same steps for alarm-2 hysteresis (HY2), alarm-3 hysteresis (HY3), and alarm-4 hysteresis (HY4) that are displayed after this.**

**9. Press the SET/ENT key for more than 3 seconds. This returns you to the display shown at power-on (figure below).**



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# 3. Operations

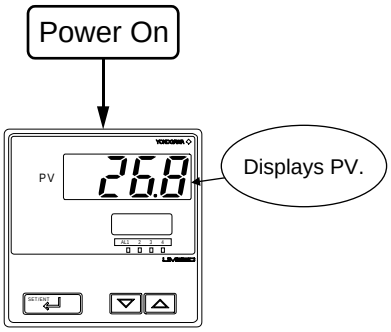
**This chapter describes key entries for operating the indicator. If you cannot remember how to carry out an operation during setting, press the SET/ENT key for more than 3 seconds. This brings you to the display (operating display) that appears at power-on.**

## NOTE

Do not use the instrument generating strong magnetic field such as radio equipment and the like near the indicator. This may cause the fluctuation of the PV value.

## 3.1 Monitoring-purpose Operating Display Available during Operation

The following is the monitoring-purpose operating display available during operation.

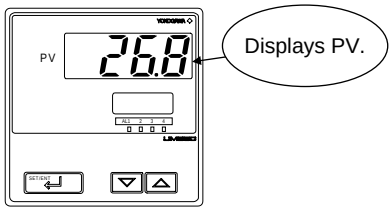


# 3.2 Setting Alarm Setpoints

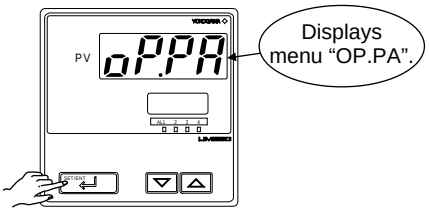
The following operating procedure describes an example of setting a value of 160.0 in the alarm-1 setpoint parameter. Before setting the alarm setpoint, check the alarm type. To change the alarm type, see “2.4 Changing Alarm Type.”

| Alarm output terminals | Factory-set defaults |
|---|---|
| Alarm-1 (terminal numbers ⑥-⑦) | PV high limit alarm |
| Alarm-2 (terminal numbers ⑤-⑦) | PV low limit alarm |
| Alarm-3 (terminal numbers ④-⑦) | PV high limit alarm |
| Alarm-4 (terminal numbers ①-②-③) | PV low limit alarm |

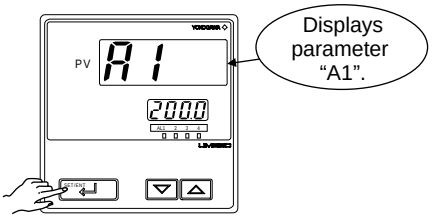
**1. Bring the operating display into view (display appears at power on).**



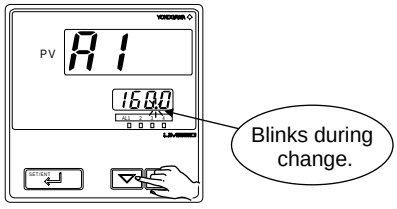

**2. Press the SET/ENT key for more than 3 seconds to call up the menu “OP.PA”.**



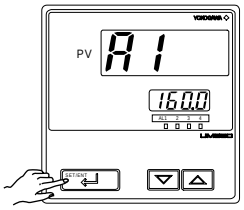

**3. Press the SET/ENT key once to display the parameter “A1”.**




**4. Press the ▲ or ▼ key to display the required setpoint.**

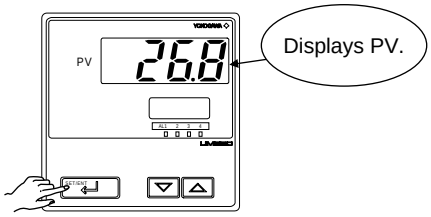



**5. Press the SET/ENT key once to register the setpoint.**




**You can take the same steps for alarm-2 setpoint (A2), alarm-3 setpoint (A3), and alarm-4 setpoint (A4) that are displayed after this.**

**6. Press the SET/ENT key for more than 3 seconds. This returns you to the display shown at power-on (figure below).**



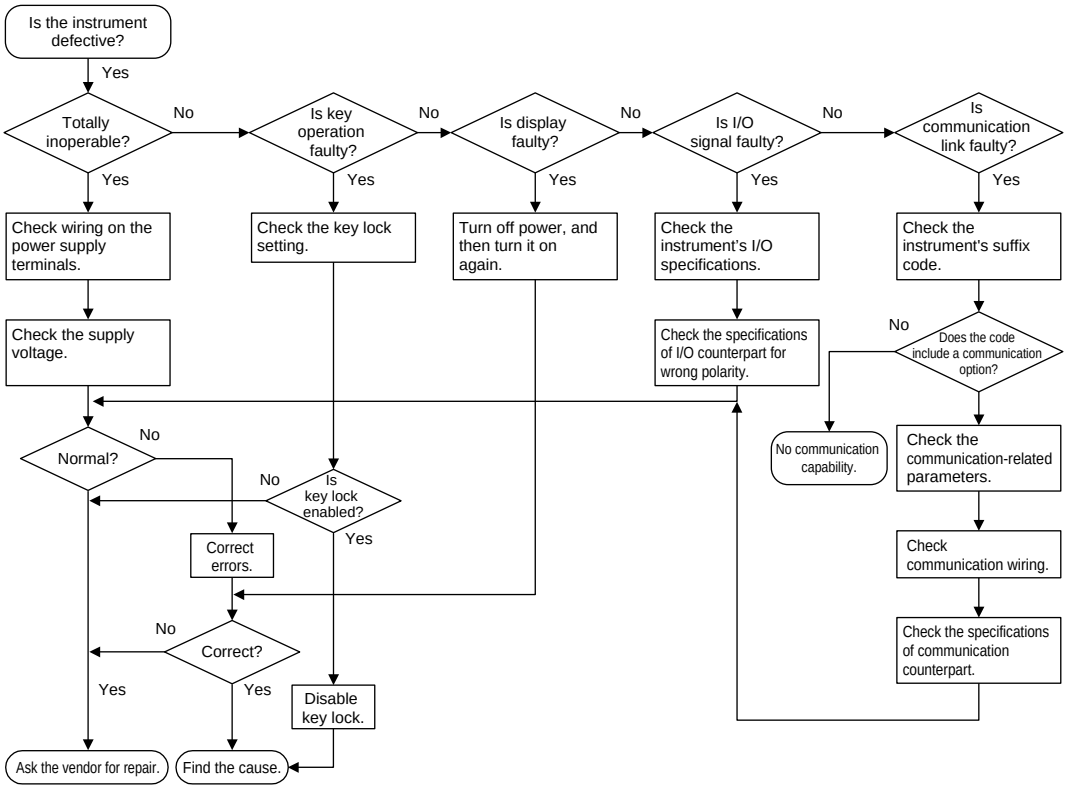
# 4. Troubleshooting and Maintenance

## 4.1 Troubleshooting

### ■ Troubleshooting Flow

If the operating display does not appear after turning on the indicator's power, try to solve the problem by following the procedure below.

If the problem seems to be complex, contact the vendor from which you purchased the instrument.




### IMPORTANT

Take note of the parameter settings when asking the vendor for repair.

## ■ Errors at Power on

The following table shows errors that may be detected by the fault diagnosis function when the power is turned on.

| Error indication (on PV display unit) | Description of error | PV | Control output | Alarm output | Retransmission output | Communi-cation | Remedy |
|---|---|---|---|---|---|---|---|
| E000 (E000) | Faulty RAM | None | 0% or less or OFF | OFF | 0% or less | Stopped | Faulty Contact us for repair. |
| E001 (E001) | Faulty ROM | | | | | | |
| E002 (E002) | System data error | 0% | | | 0% | Normal action | |
| PV decimal point blinks. | Faulty calibration value | Normal action (out of accuracy) | Normal action (out of accuracy) | Normal action (out of accuracy) | Normal action (out of accuracy) | | |
| E400 (E400) | Parameter error | 0% | Preset value | OFF | 0% | | Check and set the parameters, as they have been set to the limited values. |

## ■ Possible Errors during Operation

The following shows possible errors occurring during operations.

| Error indication (on PV display unit) | Description of error | PV | Control output | Alarm output | Retransmis-sion output | Commu-nication | Remedy |
|---|---|---|---|---|---|---|---|
| Displays "RJC" and PV alternately | RJC error | Measured with RJC=OFF | Normal action | Normal action | Normal action | Normal action | Faulty Contact us for repair. |
| PV value blinks. | EEPROM error | Normal action | Normal action | Normal action | Normal action | Normal action | Faulty Contact us for repair. |
| E300 (E300) | A/DC error | 105% | Preset value | Normal action | Normal action | Normal action | |
| b.oUt (B.OUT) | PV burnout error | Dependent on the BSL parameter Up-scale: 105% Down-scale: -5% | Preset value | Normal action | Normal action | Normal action | Check wires and sensor. |
| oVr (OVER) or -oVr (-OVER) | Excessive PV Out of -5 to 105% | -5% or 105% | Normal action | Normal action | Normal action | Normal action | Check process. |
| SP decimal point blinks. (on setpoint display unit) | Faulty communi-cation line | Normal action | Normal action | Normal action | Normal action | Normal action | Check wires and communication parameters, and make resetting. Recovery at normal receipt |
| All indications off | Runaway (due to defective power or noise) | None | 0% or less or OFF | OFF | 0% or less | Stopped | Faulty if power off/on does not reset start the unit. Contact us for repair. |
| All indications off | Power off | None | 0% | OFF | 0% | Stopped | Check for abnormal power. |

# ■ If a Power Failure Occurs during Operation

## ● Momentary Power Failures shorter than 20 ms

The indicator is not affected at all and continues normal operation.

## ● Momentary Power Failures of 20 ms or longer

- The alarm function of the indicator continues to work normally. (Alarms with the stand-by feature temporarily return to their stand-by state, however.)
- Setting parameters that have already been configured retain their settings.

# 4.2 Maintenance

This section describes the cleaning and maintenance of the UM350/UM330.

## 4.2.1 Cleaning

The front panel and operation keys should be gently wiped with a dry cloth.

**NOTE**

Do not use alcohol, benzine, or any other solvents.

## 4.2.2 Replacing Brackets

When the brackets are broken or lost, purchase the following brackets for replacement.

| Target Model | Part No. | Sales Unit |
|---|---|---|
| UM350 | T9115NL | A large bracket and small bracket in pair |
| UM330 | T9115NK | Small brackets in pair |

**SEE ALSO**

“1.2 How to Install,” for how to replace brackets.

## 4.2.3 Attaching Terminal Cover

When a terminal cover is necessary, purchase the following part.

| Target Model | Part No. | Sales Unit |
|---|---|---|
| UM350 | T9115YD | 1 |
| UM330 | T9115YE | 1 |

## ■ Attaching Terminal Cover

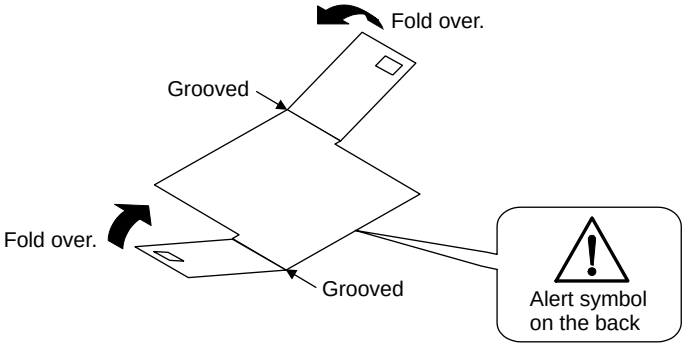
The procedure for attaching the terminal cover is as follows.

**CAUTION**

Do not touch the terminals on the rear panel when power is being supplied to the indicator. Doing so may result in electric shock.

Before attaching the terminal cover, turn off the source circuit breaker and use a tester to check that the power cable is not conducting any electricity.

**1. Before attaching the terminal cover, fold it once or twice so that the side which has the "Handle With Care" symbol (⚠), is on the outside.**

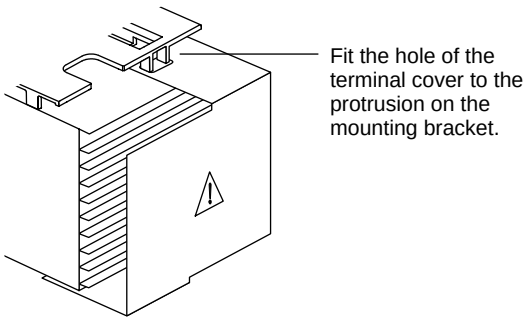



**Folding Direction of Terminal Cover**

**NOTE**

Do not fold the terminal cover the wrong way, doing so not only reduces the cover's strength but may also cause the hinge to crack, thereby disabling attachment.

**2. With the cover properly folded, fit its top and bottom holes to the protrusions of the mounting brackets.**




**Attaching Terminal Cover**

## 4.2.4 Replacing Parts with a Limited Service Life

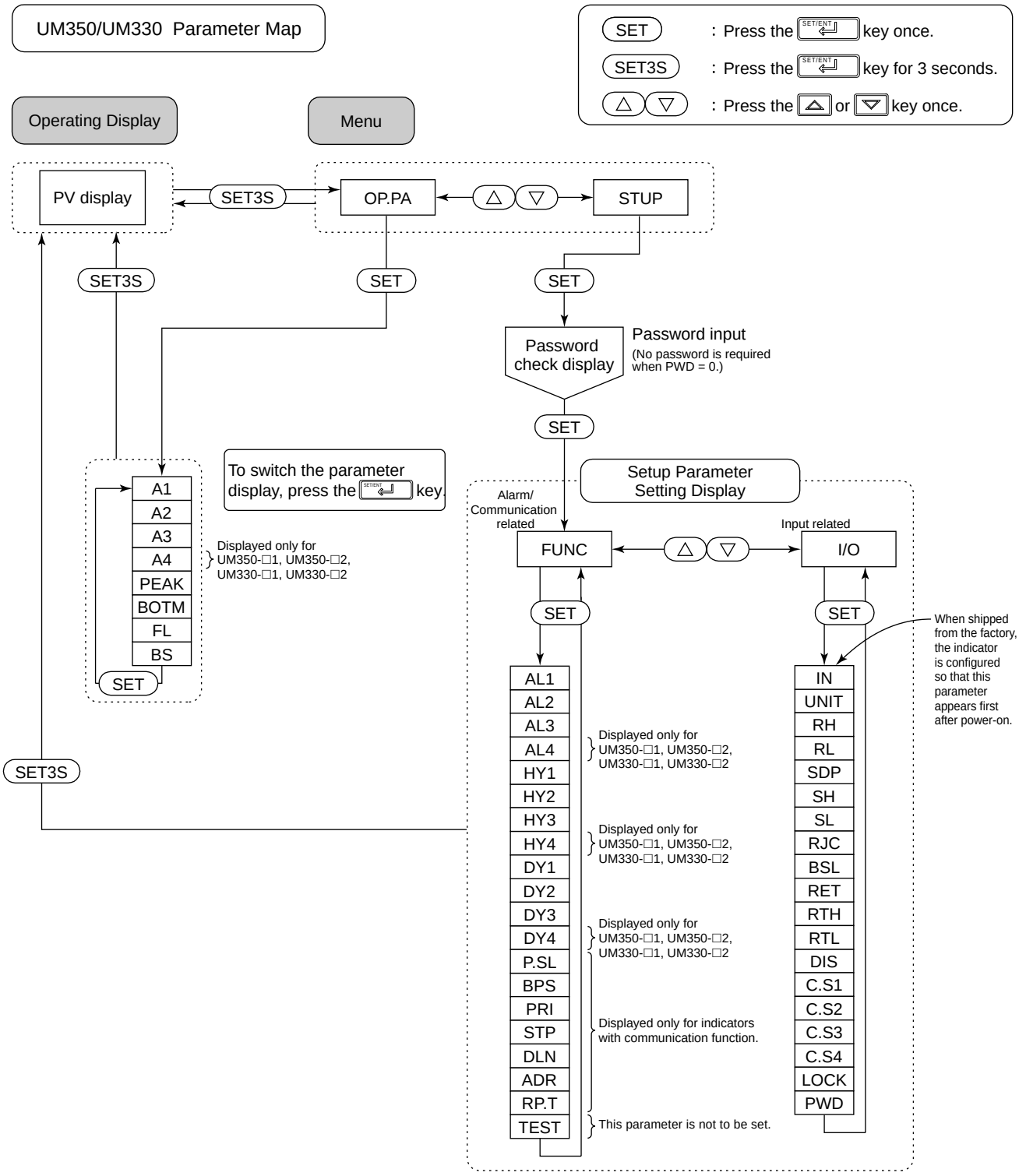
The following UM350/UM330 parts have a limited service life.
The service life given in the table assume that the controller is used under normal operating conditions.

| Part | Service life |
|---|---|
| Aluminum electrolytic condenser | About 10 years (rated) |
| EEPROM | About 100,000 times of writings |
| Alarm 4 output relays | About 100,000 more ON-OFF operations or with resistance load |

# 5. Parameters

**This chapter contains a parameter map as a guideline for setting parameters, and lists of parameters for recording User Settings.**

## 5.1 Parameter Map



# 5.2 Lists of Parameters

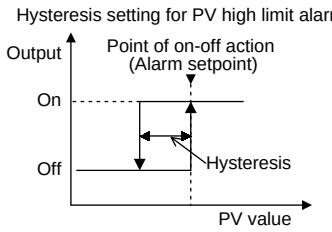
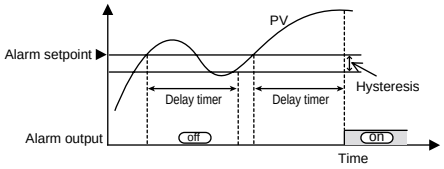
* Parameters relating to PV should all be set in real numbers.
  For example, use temperature values to define alarm setpoints for temperature input.
* The “User Setting” column in the table is provided for the customer to record setpoints.
* Numbers in ( ) are the parameter setpoints that apply when the communication function is used. ex. OFF (0)

## ■ Operating Parameters

| Parameter Symbol | Name of Parameter | Setting Range and Description | Initial Value | User setting |
|---|---|---|---|---|
| A1 (A1) | Alarm 1-setpoint | PV alarm: -100.0 to 100.0% of PV input range | PV high limit alarm: 100.0% of PV input range<br>PV low limit alarm: 0.0% of PV input range | |
| A2 (A2) | Alarm 2-setpoint | | | |
| A3 (A3) | Alarm 3-setpoint | | | |
| A4 (A4) | Alarm 4-setpoint | | | |
| PEAK (PEAK) | PV peak value | Displays the maximum value of PV input during operation.<br>This parameter is not to be set. | | |
| botm (BOTM) | PV bottom value | Displays the minimum value of PV input during operation.<br>This parameter is not to be set. | | |
| FL (FL) | PV input filter | OFF (0), 1 to 120 sec.<br>Used when the PV input fluctuates. | OFF (0) | |
| bS (BS) | PV input bias | -100.0% to 100.0% of PV input range span<br>Used to correct the PV input value. | 0.0% of PV input range span | |

# ■ Setup Parameters

## ● Alarm/Communication Related Parameters

| Parameter Symbol | Name of Parameter | Setting Range and Description | Initial Value | User Setting |
|---|---|---|---|---|
| AL 1 (AL1) | Alarm-1 type | OFF (0)<br>1: PV high limit (energized, no stand-by action)<br>2: PV low limit (energized, no stand-by action)<br>9: PV high limit (de-energized, no stand-by action)<br>10: PV low limit (de-energized, no stand-by action)<br>11: PV high limit (energized, stand-by action)<br>12: PV low limit (energized, stand-by action)<br>19: PV high limit (de-energized, stand-by action)<br>20: PV low limit (de-energized, stand-by action)<br>21: Fault diagnosis output<br>Turns on in case of input burnout, A/D converter failure, or reference junction compensation (RJC) failure.<br>22: FAIL output<br>Turns off in case of program failure, ROM failure, RAM failure, or power failure. This output is on during normal operation. If it turns off, the retransmission output is set to 0%, the alarm output is set to OFF, and the indicator stops.<br><br>See “List of Alarm Types” for details on how these Alarm Type parameters behave. | 1 | |
| AL2 (AL2) | Alarm-2 type | | 2 | |
| AL3 (AL3) | Alarm-3 type | | 1 | |
| AL4 (AL4) | Alarm-4 type | | 2 | |
| HY1 (HY1) | Alarm-1 hysteresis | 0.0 to 100.0% of PV input range span<br><br>Hysteresis can be set in the alarm setpoint. Setting hysteresis prevents relays from chattering.<br>  | 0.5% of PV input range span<br>Output alarms 0.5% | |
| HY2 (HY2) | Alarm-2 hysteresis | | | |
| HY3 (HY3) | Alarm-3 hysteresis | | | |
| HY4 (HY4) | Alarm-4 hysteresis | | | |
| dY1 (DY1) | Alarm-1 delay timer | An alarm is output when the delay timer expires after the alarm setpoint is reached.<br>0.00 to 99.59 (min, sec.) (enabled when alarm-1 type “AL1” is 1, 2, 9, 10, 11, 12, 19, and 20)<br>  | 0.00 | |
| dY2 (DY2) | Alarm-2 delay timer | 0.00 to 99.59 (min, sec.) (enabled when alarm-2 type “AL2” is 1, 2, 9, 10, 11, 12, 19, and 20) | | |
| dY3 (DY3) | Alarm-3 delay timer | 0.00 to 99.59 (min, sec.) (enabled when alarm-3 type “AL3” is 1, 2, 9, 10, 11, 12, 19, and 20) | | |
| dY4 (DY4) | Alarm-4 delay timer | 0.00 to 99.59 (min, sec.) (enabled when alarm-4 type “AL4” is 1, 2, 9, 10, 11, 12, 19, and 20) | | |
| P.SL (P.SL) | Protocol selection | 0: PC link communication<br>1: PC link communication (with sum check)<br>2: Ladder communication<br>7: MODBUS (ASCII)<br>8: MODBUS (RTU) | 0 | |
| bPS (BPS) | Baud rate | 0: 600, 1: 1200, 2: 2400, 3: 4800, 4: 9600 (bps) | 4 | |

| Parameter Symbol | Name of Parameter | Setting Range and Description | Initial Value | User Setting |
|---|---|---|---|---|
| PrI (PRI) | Parity | 0: None<br>1: Even<br>2: Odd | 1 | |
| StP (STP) | Stop bit | 1, 2 | 1 | |
| dLn (DLN) | Data length | 7, 8<br>Fixed at 7, when the P.SL parameter is set to MODBUS (ASCII).<br>Fixed at 8, when the P.SL parameter is set to MODBUS (RTU) or Ladder Communication. | 8 | |
| Adr (ADR) | Address | 1 to 99<br>However, the maximum number of stations connectable is 31. | 1 | |
| rPt (RP.T) | Minimum response time | 0 to 10 (× 10 ms) | 0 | |
| tESt (TEST) | If this parameter symbol appears, press the SET/ENT key to return to the FUNC menu.<br><br>Caution: Do not change the setpoint of the TEST parameter, otherwise the indicator will be disabled. | | | |

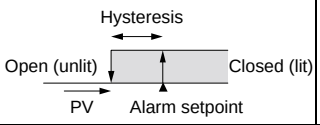
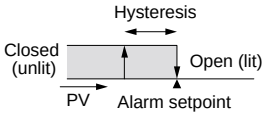
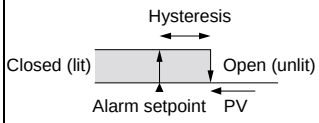
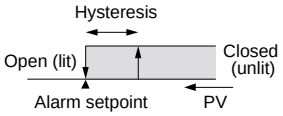
## ● Input-/Output-related Parameters

| Parameter Symbol | Name of Parameter | Setting Range and Description | Initial Value | User Setting |
|---|---|---|---|---|
| In (IN) | PV input type (PV INPUT terminals)<br>⑪ - ⑫ - ⑬ terminals | OFF, 1 to 18, 30, 31, 35 to 37, 40, 41, 50, 51, 55, 56<br>See Instrument Input Range Codes in "2. Initial Settings." | OFF (0) | |
| Unit (UNIT) | PV input unit | °C (0): degree Celsius<br>°F (5): Fahrenheit | °C (0) | |
| rH (RH) | Max. value of PV input range | Set the PV input range, however RL < RH<br>-Temperature input<br>Set the range of temperature that is actually indicated.<br>- Voltage input<br>Set the range of a voltage signal that is applied.<br>The scale across which the voltage signal is actually indicated should be set using the parameters Maximum Value of PV Input Scale (SH) and Minimum Value of PV Input Scale (SL). | Max. value of instrument input range | |
| rL (RL) | Min. value of PV input range | | Min. value of instrument input range | |
| SdP (SDP) | PV input decimal point position (displayed at voltage input) | 0 to 3<br>Set the position of the decimal point of voltage-mode PV input.<br>0: No decimal place<br>1: One decimal place<br>2, 3: Two, three decimal places | 1 | |
| SH (SH) | Max. value of PV input scale (displayed at voltage input) | -1999 to 9999, however SL < SH<br>Set the read-out scale of voltage-mode PV input. | 100.0 | |
| SL (SL) | Min. value of PV input scale (displayed at voltage input) | | 0.0 | |
| bSL (BSL) | Selection of PV input burnout action | OFF (0)<br>1: Up scale<br>2: Down scale | 1 | |
| rJC (RJC) | Presence/absence of PV input reference junction compensation | OFF (0), ON (1) | ON (1) | |
| rEt (RET) | Retransmission output type | OFF (0): Does not work.<br>1: PV<br>4: Loop power supply for sensor (15 V) | 1 | |
| rtH (RTH) | Max. value of retransmission output scale | RET=1: RTL + 1 digit to 100.0% of PV input range | 100.0% of PV input range | |
| rtL (RTL) | Min. value of retransmission output scale | RET=1: 0.0% of PV input range to RTH - 1 digit | 0.0% of PV input range | |

| Parameter Symbol | Name of Parameter | Setting Range and Description | Initial Value | User Setting |
|---|---|---|---|---|
| dIS (DIS) | DI function selection | OFF (0): The external contact input is disabled.<br>1: Resets the values of the PEAK and BOTM operating parameters to an off-to-on transition of the DI1 input. | 1 | |
| C.S1 (C.S1) | SELECT display-1 registration | OFF (0), 201 to 1015<br>For example, registering “231” for C.S1 allows you to change alarm-1 setpoint in operating display.<br><br>Numbers for registering alarm SP parameter for operating display:<br>Alarm-1 setpoint: 231 Alarm-2 setpoint: 232<br>Alarm-3 setpoint: 233 Alarm-4 setpoint: 234 | OFF (0) | |
| C.S2 (C.S2) | SELECT display-2 registration | | | |
| C.S3 (C.S3) | SELECT display-3 registration | | | |
| C.S4 (C.S4) | SELECT display-4 registration | | | |
| LoCK (LOCK) | Key lock | OFF (0): No key lock<br>1: Change to any parameter prohibited<br>Prohibits any operating parameter or setup parameter from being changed. The setpoint of the LOCK parameter itself can be changed, however.<br>2: Change to and display of operating parameters prohibited<br>Turns off the display for setting operating parameters, thus prohibiting any change to the parameter settings.<br>(Press the SET/ENT key for more than 3 seconds to show the password check display.) | OFF (0) | |
| PWD (PWD) | Password setting | 0: Password not set<br>1 to 9999 | 0 | |

## ■ List of Alarm Types

The table below shows the alarm types and alarm actions.
In the table, codes 1, 2, 9, and 10 are not provided with stand-by actions, while codes 11, 12, 19, and 20 are provided with stand-by actions.

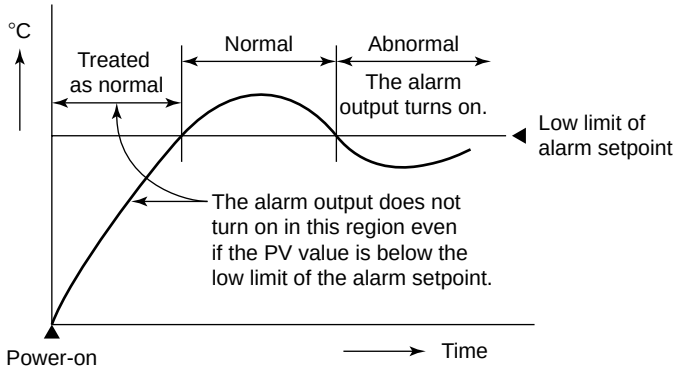
| Alarm type | Alarm action<br>"Open/close" shows status of relay contact, and "lit" and "unlit" shows status of lamp | Alarm type code<br>Contact closes if alarm occurs | Alarm type code<br>Contact opens if alarm occurs | Alarm type | Alarm action<br>"Open/close" shows status of relay contact, and "lit" and "unlit" shows status of lamp | Alarm type code<br>Contact closes if alarm occurs | Alarm type code<br>Contact opens if alarm occurs |
|---|---|---|---|---|---|---|---|
| No alarm | | OFF | | | | | |
| PV high limit |  | 1<br>11 | | De-energized on PV high limit |  | | 9<br>19 |
| PV low limit |  | 2<br>12 | | De-energized on PV low limit |  | | 10<br>20 |
| Fault diagnosis output (Note 1) | | 21 | | FAIL output (Note 2) | | | 22 |

Note 1: Fault diagnosis output
Turns on in case of input burnout, A/D converter failure, or reference junction compensation (RJC) failure.
Note 2: FAIL output
Turns off in case of program failure, ROM failure, RAM failure, or power failure. This output is on during normal operation.
If it turns off, the retransmission output is set to 0%, the alarm output is set to OFF, and the indicator stops.

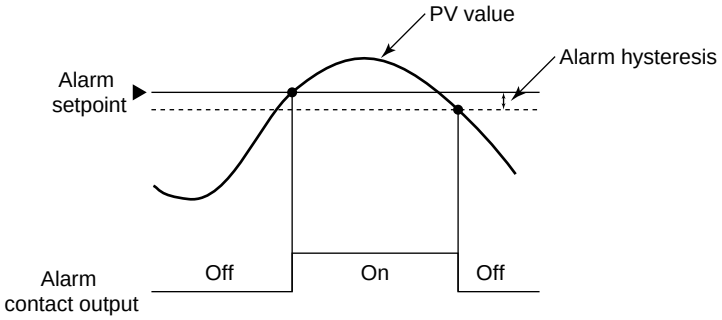
### Stand-by Action

It is effective in the following cases where;

- the power is turned on
- the alarm type is changed

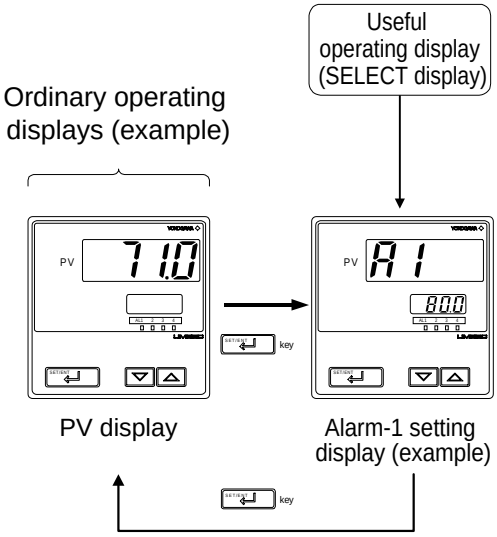

°C
Treated as normal
Normal
Abnormal
The alarm output turns on.
Low limit of alarm setpoint
The alarm output does not turn on in this region even if the PV value is below the low limit of the alarm setpoint.
Power-on
Time

### ● Behavior of the PV High-limit Alarm Parameter (Alarm Type Code: 1)



# ■ Useful Operating Display (SELECT Display)

Registering frequently changed parameters in the SELECT display after ordinary operating displays will allow you to change settings easily. A maximum of four displays can be registered.




**<Setting Method>**

Set the parameter numbers (D register numbers) you wish to register for setup parameters C.S1 to C.S4.

## ● Numbers for Registration with SELECT Display

| Operating Parameter | Registration Number | Setup Parameter | Registration Number |
|---|---|---|---|
| Alarm-1 setpoint (A1) | 231 | Alarm-1 hysteresis | 919 |
| Alarm-2 setpoint (A2) | 232 | Alarm-2 hysteresis | 920 |
| Alarm-3 setpoint (A3) | 233 | Alarm-3 hysteresis | 921 |
| Alarm-4 setpoint (A4) | 234 | Alarm-4 hysteresis | 922 |
| Bias (BS) | 243 | | |
| Filter (FL) | 244 | | |

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